

What is Claimed:

- 1 1. A cradle motion unit for positioning a test head, comprising
2 a support structure which provides three degrees freedom;
3 a first lock; and
4 a second lock,
5 wherein motion in the three degrees of freedom are prevented by actuation of
6 the first lock and the second lock.
- 1 2. The cradle motion unit of claim 1, wherein the three degrees of
2 freedom include a translation motion along a first axis, a first rotation motion
3 about a second axis, and a second rotation motion about a third axis.
- 1 3. The cradle motion unit of claim 2, wherein actuation of the first
2 and second locks prevents the first and second rotation motions and the
3 translation motion.
- 1 4. The cradle motion unit of claim 2, wherein the support structure
2 includes a first cradle side and a plate coupled to the first cradle side for
3 providing the translation motion and the first axis that is substantially parallel
4 to the first cradle side.
- 1 5. The cradle motion unit of claim 4, wherein the second axis is
2 orthogonal to the first axis.
- 1 6. The cradle motion unit of claim 5, wherein the third axis is
2 orthogonal to the first axis and the second axis.
- 1 7. The cradle motion unit of claim 6, further comprising:
2 at least one guide block coupled to the load, the at least one guide
3 block having a circular arc shaped slot, wherein
4 a center of the circular arc shaped slot is aligned with the third
5 axis, and
6 the circular arc shaped slot is located on a circle that is
7 orthogonal to the third axis.
- 1 8. The cradle motion unit of claim 4, further comprising:
2 a least one guide block coupled to the load, the at least guide
3 block having a circular arc shaped slot; and
4 at least one cam follower attached to the plate for insertion into
5 the circular arc shaped slot.

1 9. The cradle motion unit of claim 7, further comprising
2 at least one cam follower attached to the plate for insertion into
3 the circular arc shaped slot,
4 wherein the circular arc shaped slot and the at least one cam follower are
5 arranged so that rotation about the center is not at a center of gravity of the
6 load.

1 10. A system having three degrees of freedom where the first degree
2 of freedom is rotation about a first axis, the second degree of freedom is
3 rotation about a second axis which is orthogonal to the first axis, and the third
4 degree of freedom is translation along a third axis that is orthogonal to both
5 the first axis and the second axis, and having two locks such that motion in all
6 three degrees of freedom is inhibited when both locks are activated.

1 11. An apparatus for positioning a load, the system comprising:
2 a vertical support structure;
3 a plurality of horizontal surfaces including
4 (a) at least one of a first upward surface and a first
5 downward surface, and
6 (b) at least one of a second upward surface and a second
7 downward surface;
8 a plurality of horizontal rails,
9 wherein at least one of the plurality of horizontal rails is mounted to at least
10 one of the plurality of horizontal surfaces.

1 12. The apparatus of claim 11, wherein the plurality of horizontal rails
2 includes a first rail projecting in a first vertical plane and a second rail
3 projecting in a second vertical plane.

1 13. The system of claim 12, wherein the first vertical plane is
2 orthogonal to one of the plurality of horizontal surfaces.

1 14. The system of claim 12, wherein the second vertical plane is
2 orthogonal to one of the plurality of horizontal surfaces.

1 15. The apparatus of claim 12, further comprising a horizontal support
2 structure for coupling to a load, the horizontal support structure being coupled
3 to at least one of the plurality of horizontal rails for positioning relative to the
4 vertical support structure.

1 16. An apparatus attached to a side of a cradle for positioning a load
2 relative to the cradle, the apparatus comprising:
3 a sliding arm structure between the side of the cradle and the load
4 for translation motion along a first axis;
5 an arm support block, also between the side of the cradle and the
6 load, for rotating the load about a second axis orthogonal to the first axis;
7 a guide block structure, at least a portion thereof being between
8 the side of the cradle and the load, for rotating the load about a third axis
9 orthogonal to the first axis and the second axis.

1 17. The apparatus of claim 16, wherein the guide block structure
2 includes at least one circular arc shaped slot that defines the second rotation
3 motion, the third axis being located at a center of the at least one circular arc
4 shaped slot.

1 18. The apparatus of claim 16, wherein
2 the sliding arm structure is attached to the side of the cradle,
3 the arm support block is adjacent to the sliding arm structure and
4 between the sliding arm structure and the guide block structure, and
5 the guide block structure is coupled to the cradle.

1 19. The apparatus of claim 16, further comprising
2 a first lock coupled to the cradle; and
3 a second lock coupled to the sliding arm structure,
4 wherein actuation of the first and second locks prevents the translation motion,
5 the first rotation motion, and the second rotation motion.

1 20. A method for positioning a test head in a cradle motion unit, the
2 method comprising the steps of:
3 positioning the test head on a first degree of freedom;
4 positioning the test head on a second degree of freedom;
5 positioning the test head on a third degree of freedom;
6 actuating a first lock coupled to the cradle; and
7 actuating a second lock coupled to the cradle,
8 wherein actuation of the first and second locks prevents motion in the three
9 degrees of motion.

- 25 -

- 1 21. A method of positioning a test head relative to a cradle while said
- 2 cradle is kept stationary, the method comprising the steps of:
- 3 imparting linear motion relative to the cradle;
- 4 imparting tumble motion relative to the cradle;
- 5 imparting theta motion relative to the cradle;
- 6 actuating a first lock coupled to the cradle; and
- 7 actuating a second lock coupled to the cradle,
- 8 wherein actuation of the first and second locks prevents motion in
- 9 the three degrees of motion.